

REMARKS

Claims 89-92 and 99-109 are all of the claims presently pending in the application. Claims 93-98 have been canceled without prejudice or disclaimer. Claims 89, 91 and 108 have been amended to more particularly define the claimed invention. Claim 109 has been added to provide more varied protection for the claimed invention.

Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claim 97 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 89, 92-94, 99, 101-103 and 106 stand rejected under 35 U.S.C. §102(e) as being anticipated by, or in the alternative under 35 U.S.C. §103(a) as obvious over Soules et al. (U.S. Patent No. 6,252,254; hereinafter “Soules”). Claims 89, 91-94, 99 and 101-107 stand rejected under 35 U.S.C. §102(e) as being anticipated by Komoto et al. (U.S. Patent No. 6,340,824; hereinafter “Komoto”). Claims 89, 92, 93, 95-99 and 108 stand rejected under 35 U.S.C. §102(e) as being anticipated by, or in the alternative under 35 U.S.C. §103(a) as obvious over Marshall et al. (U.S. Patent No. 6,513,949; hereinafter “Marshall”). Claims 90 and 100 stand rejected under 35 U.S.C. §103(a) as unpatentable over Marshall or Komoto in view of Hampden-Smith et al. (U.S. Patent No. 6,153,123; hereinafter “Hampden-Smith”). Claims 95-98 and 108 stand rejected under 35 U.S.C. §103(a) as unpatentable over Marshall in view of Komoto.

These rejections are respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

The claimed invention of exemplary claim 89 provides a first light source including a first semiconductor light-emitting element that emits a blue light and a third light source including a second semiconductor light-emitting element that emits a red light (see Application at Figure 17; and corresponding text). Applicants' invention provides a light-emitting apparatus of high luminance and high efficiency (see Application at page 3, lines 9-13).

II. THE INDEFINITENESS REJECTION

Claim 97 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the Examiner alleges that the claim language is vague and appears to be in contradiction to the claim language of claim 95, from which it depends.

Applicants submit that claim 97 has been canceled, thus rendering the Examiner's rejection moot.

III. THE PRIOR ART REFERENCES

A. The Soules Reference

The Examiner alleges that Soules teaches (or makes obvious) the claimed invention of claims 89, 92-94, 99, 101-103 and 106. Additionally, the Examiner alleges that Komoto teaches the claimed invention of claims 89, 91, 91-94, 99 and 101-107. Applicants submit that there are elements of the claimed invention that are not taught or suggested by Soules nor Komoto.

That is, neither Soules nor Komoto teaches or suggests “*a first light source comprising a first semiconductor light-emitting element that emits a blue light*” and “*a third light source comprising a second semiconductor light-emitting element that emits a red light*”, as recited in independent claim 89, and somewhat similarly recited in independent claim 108.

Soules and Komoto teach obtaining white light by combination of a blue LED, a green fluorescent material, and a red fluorescent material. However, these references fail to teach or suggest obtaining two (or more) kinds of light from plural LEDs (for example, first and third light sources as recited in claim 89 and two semiconductor light-emitting elements as recited in claim 108).

Basically, emitted light from an LED has a single wavelength and its light intensity is high. On the other hand, light excited or converted by fluorescent material has a wide range of wavelengths, but its light intensity is lower as compared with the emitted light from an LED.

A combination of only one LED and plural fluorescent materials does not supply a good balance between the LED emitted light and excited or converted lights by fluorescent materials. That is, the light emitted by the light emitting apparatus with a single LED plus plural fluorescent materials does not supply the balanced range of wavelength, even though it emits apparently a white light. The color reproduction is not good.

On the other hand, since the claimed light-emitting apparatus are provided with at least two kinds of LED emissions, a good balance among the LED based lights, which have relatively high light intensities, and fluorescent lights, which widen the wavelength

of the total emission, can be maintained. Accordingly, superior color rendering properties, as compared to the light-emitting apparatus disclosed in Soules and Komoto using the combination of a single LED and plural fluorescent materials, can be obtained.

Therefore, Applicants submit that neither Soules nor Komoto teaches or suggests each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw these rejections.

B. The Marshall Reference

The Examiner alleges that Marshall teaches (or makes obvious) the claimed invention of claims 89, 92, 93, 95-99 and 108. Furthermore, the Examiner alleges that Komoto would have been combined with Marshall to teach the claimed invention of claims 95-98 and 108. Applicants submit that there are elements of the claimed invention that are not taught or suggested by Marshall (taken alone or in combination with Komoto).

That is, Marshall (taken alone or in combination with Komoto) does not teach or suggest “*wherein said second light source surrounds outer peripheries of said first light source and said third light source, and said blue light emitted by said first light source, said green light emitted by said second light source, and said red light emitted by said third light source are mixed to thereby generate white light*” (emphasis added by Applicants), as recited in independent claim 89, and somewhat similarly recited in independent claim 108.

Even assuming, *arguendo*, that Marshall teaches a combination of normal-type LDS (e.g., see Marshall at Figure 1a) and a fluorescent LED (e.g., see Marshall at Figure

1b, combination of LED and fluorescent material) to emit white light, Marshall fails to teach or suggest a structure to surround the normal-type LED with the fluorescent material.

In stark contrast, the claimed invention of exemplary claims 89, 108 and 109 recite that outer peripheries of the LEDs (or light emitting elements, etc.) are surrounded by a fluorescent material. Similarly to excitation light by the fluorescent material (e.g., blue light) and converted light (e.g., green light), light emitted by an LED (e.g., red light) but not excited or converted light is also diffused in the fluorescent materials if the LED is surrounded by the fluorescent materials, as claimed. Therefore, these light components (e.g., blue, green, red) are diffused evenly in such a surrounding structure of the fluorescent material. Thus, emitted color by the device becomes even. This advantage of the claimed invention is not obtained by the device of Marshall (even if combined with Komoto).

Moreover, Komoto fails to make up the deficiencies of Marshall. Indeed, the Examiner does not even allege that Komoto teaches or suggests this feature of the claimed invention. The Examiner merely alleges that Komoto teaches various lead frame cup designs.

Therefore, Applicants submit that Marshall (taken alone or in combination with Komoto) fails to teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw these rejections.

C. The Hampden-Smith Reference

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The Examiner alleges that Hampden-Smith would have been combined with Komoto or Marshall to teach the claimed invention of claims 90 and 100. Applicants submit, however, that these references, even if combined, would not teach or suggest each and every element of the claimed invention.

That is, as indicated above in sections A and B, Marshall and Komoto fail to teach or suggest each and every feature of the claimed invention. Furthermore, Applicants submit that Hampden-Smith fails to make up the deficiencies of Marshall and Komoto.

Indeed, the Examiner does not even allege that Hampden-Smith teaches or suggests the deficient features of Marshall and Komoto detailed in sections A and B, above. The Examiner merely alleges that Hampden-Smith teaches using ZnS:Eu, Cu, Au and Al phosphors for various hues of blue/green light and CaS:Eu for red light (see Hampden-Smith at column 36, lines 8-19).

Thus, Hampden-Smith fails to make up for the deficiencies of Marshall and Komoto.

Therefore, Applicants submit that these references, even if combined, would not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw these rejections.

IV. NEW CLAIM

New claim 109 has been added to claim additional features of the invention and to provide more varied protection for the claimed invention. This claim is independently patentable because of the novel and nonobvious features recited therein.

Applicants submit that new claim 109 is patentable at least based on analogous reasons to those set forth above with respect to claims 89-92 and 99-108.

V. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicants submit that claims 89-92 and 99-109, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,



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